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## Alleviation Technology of Cold Stress of Maize(*Zea mays* L.) by Low Temperatures Damage

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### [Abstract]

Maize is one of the world's three largest crops and has a long cultivation history, and is an important crop used for various purposes such as food, feed, and industrial raw materials. Recently, the agricultural environment is changing, in which the limit of cultivation of crops is shifted to the north due to the rise in temperature due to climate change. This study was conducted in experimental field of Suwon in 2022 by setting a seeding period earlier than the sowing time to establish the North Korean agricultural climatic zone and meteorological conditions. The test cultivars were silage cultivars, Kwangpyeongok and Dacheongok. As a priming test method, it was used to directly plant seeds in the field through immersion using 4mM zinc (Zn) and 2.5mM manganese (Mn), which are trace elements for seeds. The planting season was early on March 15th, April 1st, and April 15th. The number of days from sowing to silk stage of the two cultivars sown on March 15, April 1, and April 15 was 107, 93, and 85 days for Kwangpyeongok and 109, 95, and 87 days for Dacheongok, respectively. The seed priming test did not show any difference from the control group in the growth survey up to the middle stage of growth. In another test, low-temperature recovery was confirmed through nitrogen (2-5%) foliar fertilization after 3 days, 5 days, and 7 days in refrigeration (0 degrees), a selective low temperature treatment for corn in the third leaf stage. As a result of this study, it was confirmed that the low-temperature damaged corn treated at 0°C showed the same growth as that of the untreated corn through nitrogen foliar fertilization. These results suggest that urea foliar fertilization for low-temperature damage reduction of corn for silage in high-latitude climates will be helpful. In addition, through the results of the study, additional studies are needed on the recovery mechanism and field application through urea foliar fertilization.

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